National Transportation Safety Board
Aviation Accident Final Report

Location:	Grants Pass, OR	**Accident Number:**	SEA07LA039
Date & Time:	12/29/2006, 1440 PST	**Registration:**	N234RV
Aircraft:	Averyt Vans RV-4	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The passenger reported that the experimental amateur-built airplane was in cruise flight about 12 miles from the airport when a bird impacted the propeller, and the airplane started shaking and vibrating violently. The flight returned to the airport, and the pilot entered the traffic pattern for landing. The airplane was high and fast on final for runway 30, and when it was about 1/2 to 2/3 of the way down the runway, the pilot decided to go around. When the throttle was advanced, the engine ran rough and did not produce power. During the go around attempt, the airplane entered a stall and subsequently impacted terrain about 500 feet beyond the departure end of the runway. Examination of the wreckage revealed that one blade of the experimental wooden propeller was broken off at the hub, and the other blade was broken off at approximately midspan. Wood fragments identified as being from a propeller blade were found at the accident site. Laboratory examination of the remaining portion of the propeller and the recovered blade fragments indicated the fragments were from the blade that was broken off at the hub, and this blade likely fractured as a result of ground impact. The fracture features found on the blade that separated near midspan were consistent with a traumatic event such as an in-flight bird strike. No obvious signs of bird residue were noted on the propeller, but the loss of the outboard portion of the blade prevented examination of this part of the propeller.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate airspeed during performance of a go-around, resulting in an inadvertent stall and subsequent in flight collision with the ground. A contributing factor was the in-flight loss of a portion of one propeller blade.

Findings

Occurrence #1: PROPELLER FAILURE/MALFUNCTION
Phase of Operation: CRUISE

Findings
1. (F) PROPELLER SYSTEM/ACCESSORIES,BLADE - SEPARATION

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: GO-AROUND (VFR)

Findings
2. GO-AROUND - PERFORMED - PILOT IN COMMAND
3. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
4. (C) STALL - INADVERTENT - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. TERRAIN CONDITION - GROUND

Factual Information

On December 29, 2006, about 1440 Pacific standard time, an Averyt Vans RV-4 amateur-built experimental airplane, N234RV, impacted terrain following a loss of control during a go around at Grants Pass Airport, Grants Pass, Oregon. The airplane was registered to and operated by the pilot. The commercial pilot and the passenger received serious injuries, and the airplane sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed for the local personal flight conducted under 14 CFR Part 91. The flight originated at an unknown time from the Grants Pass Airport.

The passenger reported to Federal Aviation Administration (FAA) inspectors and to the airport manager that the flight departed from Grants Pass and proceeded towards the coast. While flying over the Rogue River, about 12 miles from the airport, a bird impacted the propeller, and the airplane started shaking and vibrating violently. The flight returned to the airport, and the pilot entered the traffic pattern for landing. The airplane was high and fast on final for runway 30, and when it was about 1/2 to 2/3 of the way down the runway, the pilot decided to go around. When the throttle was advanced, the engine "performed very badly, misfiring, vibrating, and not producing power." During the go around attempt, the airplane entered a stall and subsequently impacted terrain about 500 feet beyond the departure end of the runway.

During an on scene examination of the wreckage, FAA inspectors noted that one blade of the wooden propeller was broken off at the hub, and the other blade was broken off at approximately midspan. Wood fragments identified as being from a propeller blade were found at the accident site. The fiberglass propeller spinner was not found at the accident site. The propeller was identified as a Pacesetter experimental propeller. At the request of the National Transportation Safety Board (NTSB) investigator in charge (IIC), the remaining portion of the propeller and the blade fragments were sent to the NTSB Materials Laboratory for examination.

The NTSB Materials Laboratory reported that the propeller was made from a series of six laminates, each about 3/4 inch thick, that were glued together and then formed into the shape of the blade. The lab labeled the separation of the blade broken off near midspan as fracture "1" and the separation of the blade broken off at the hub as fracture "2." Fracture "1" was located primarily between 12 to 18 inches from the center of the hub. The two laminate layers on the forward side of the blade were fractured about 16 inches from the center of the hub on a relatively flat plane. Examination of the fracture through these laminates showed pulled out fibers indicative of a tensile fracture region. The remainder of the blade contained multiple fracture planes, with significant splintering, indicative of bending loads. Fracture "1" also progressed through an area of what appeared to be solid epoxy along the leading edge of the blade arm. This epoxy region was fractured near the tensile fracture region in the two forward laminate layers. The overall features of fracture "1" were typical of a bending overstress fracture, with the direction of loading aft on the separated portion of the blade arm.

Fracture "2" was in the blade arm opposite fracture "1" and was closer to the hub. This fracture progressed through the laminate layers within a radial distance of about 2 to 3 inches, and minimal grain splitting or delamination was noted. Detailed visual examination of the individual broken wooden fibers in this fracture showed the presence of tensile fracture with fiber pullout over almost the entire fracture, with the possible exception of an area of

compression fracture adjacent to the aft surface of the blade. A central portion of the second and third laminate layers from the aft side of the blade split into the centerline hole and were displaced radially outboard during the fracture process. What appeared to be ground impact damage was noted on the forward face of the propeller adjacent to fracture "2". Examination of the forward side of the blade adjacent to fracture "2" showed damage where it appeared that the forward spinner bulkhead had been pushed aftward into the blade, leaving an impact mark and partially cutting into the forward two laminates.

The lab also examined a large number of pieces of the propeller (probably greater than 100 pieces) that were reportedly recovered from the accident site. Most of these pieces could not be identified as being from any specific location on the propeller. However, 11 of the pieces were positively identified as being from fracture "2", the fracture closer to the hub, based on paint markings, curvature of the exterior surface, or bolt hole features. In addition, these pieces included the inboard end of a leading edge epoxy strip, and it was noted that the inboard end of this strip was present on fracture "1", further confirming that the pieces were from fracture "2."

Neither the pilot nor the passenger responded to written requests from the NTSB IIC for their statements regarding the accident.

Pilot Information

Certificate:	Commercial	**Age:**	78, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With Waivers/Limitations	**Last FAA Medical Exam:**	01/01/2006
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Averyt	**Registration:**	N234RV
Model/Series:	Vans RV-4	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental	**Serial Number:**	234
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	O-320
Registered Owner:	On file	**Rated Power:**	160 hp
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	SXT	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	1456 PST	**Direction from Accident Site:**	360°
Lowest Cloud Condition:		**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 3600 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	340°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.25 inches Hg	**Temperature/Dew Point:**	3°C / -6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Grants Pass, OR (3S8)	**Type of Flight Plan Filed:**	None
Destination:	(3S8)	**Type of Clearance:**	None
Departure Time:	PST	**Type of Airspace:**	

Airport Information

Airport:	Grants Pass (3S8)	**Runway Surface Type:**	Asphalt
Airport Elevation:	1126 ft	**Runway Surface Condition:**	Dry
Runway Used:	30	**IFR Approach:**	None
Runway Length/Width:	3999 ft / 75 ft	**VFR Approach/Landing:**	Go Around

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	42.510278, -123.388056

Administrative Information

Investigator In Charge (IIC):	Georgia R Struhsaker	**Report Date:**	07/25/2007
Additional Participating Persons:	Dave Jourdan; FAA FSDO; Hillsboro, OR		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		